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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO. <i>clm</i>
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EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/926,592

Applicant(s)
Yamazaki

Examiner
Matthew Whipple

Group Art Unit
2813



☒ Responsive to communication(s) filed on Feb 22, 2000

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 13-17 and 19-30 is/are pending in the application.

Of the above, claim(s) none is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 13-17 and 19-30 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been received

received in Application No. (Series Code/Serial Number) _____

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s) PTO-1449, Paper No(s) 15

OFFICE ACTION ON THE FOLLOWING PAGE

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DETAILED ACTION

1. Claims 13-17, 19-21, 23-26, 28-30 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Using photo-CVD to deposit a first protective layer to prevent plasma damage to substrate and then using plasma to deposit a second layer at high deposition rates is critical or essential to the practice of the invention, but not included in the claim(s) and is therefore not enabled by the disclosure. See the instant application at page 5, last 6 lines, which teaches that applying plasma deposition first will damage the substrate, but photo CVD is slow. Applicant's invention is to deposit a first layer by photo-CVD to prevent damage and then deposit a second layer by plasma CVD to form the remainder of the film quickly. Without the photo CVD the substrate would be damaged (See pp. 6-7, Summary). See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

2. Claims 16 and 17 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It was not described in the original disclosure to deposit a phosphate or a boronsilicate glass film onto a SiO₂ film as claimed by applicant.

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Claim Rejections - 35 USC § 103

3. Claims 13, 14, 19-21, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,668,365 (Foster et al.) in view of US 4,563,367 (Sherman) and US 5,470,784 (Coleman).

Foster teaches depositing nitride and psg films insitu in a plasma reactor (col. 3, lines 15-25). However, introducing gases through the electrodes and cleaning the chamber is not taught.

Introducing gases through electrodes is extremely well known in the art to provide a plasma, as taught by both Sherman (Figure 5, item 36) and Coleman (Figure 3). Further, Sherman teaches that insitu cleaning using NF₃ is very well known to dry clean chambers and increase throughput. Both Coleman (Fig. 3) and Sherman (Fig 4, item 25A) teach multiple ports.

Therefore, it would have been obvious to introduce gases through an electrode to provide an alternative method of forming a plasma, as taught by both Sherman and Coleman. It Further would have been obvious to clean the chamber for the reasons give by Sherman.

4. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster in view of Sherman and Coleman as applied to claim 13 above, and further in view of Jones.

Foster does not teach depositing layers of the same types or phosphate or boronsilicate glasses.

However, Jones teaches depositing a plasma with boron silicate (Borosilicate) on a substrate.

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Therefore, it would have been obvious to deposit such as dielectric stack as Jones insitu for the reasons given by Foster.

Allowable Subject Matter

5. Applicant's process of which is disclosed, but not claimed is allowable. It was not taught or suggested in the prior art to form a first layer by photo-CVD and then a second layer by plasma-CVD wherein both layers are formed successively in the same chamber. Note that if the double patenting rejections were overcome, and claims 22 and 27 were put in independent form, including all the limitations of the claims from which they depend, then these claims would likely be allowable because the prior art of record does not teach forming the first layer using photo-CVD where the substrate is supported on an electrode and gases are introduced through opposing electrodes and then a second layer is formed on the first film in that same chamber using an excited second film forming gas.

Double Patenting

6. Claims 13-17 and 19-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of US 4,950,624 or claims 1-11 of U.S. Patent No. 5,629,245 or claims 7-16 of US 5,512,102 or claims 1-15 of US 4,957,120.

Semiconductor Energy Laboratory claim subject matter very near the claims of the instant

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application except that the exact chamber cleaning gases or types of deposited layers or introducing gases through electrodes is not claimed.

However, Sherman, Coleman, and Jones are applied as above.

Information Disclosure Statement

7. The information disclosure statements filed 3/16/99 and 9/4/97 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. The references not considered have been lined through. If applicant wishes to have them considered he should file a new 1449 with the statement of relevance.

Response to Arguments

8. Applicant's arguments filed 2/22/00 have been fully considered but they are not persuasive.

Regarding the 112, first paragraph enablement rejection, applicant has stated that the examiner failed to provide reasons. A further explanation of the rejection has been provided in the rejection above

expressly or inherently teach an order or the specific combination of layers claimed. Obviousness

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is not the standard for providing written description. Applicant must expressly teach the claimed invention. Therefore, applicant's arguments are not persuasive.

Regarding the prior art rejections, applicant has argued that the references fail to teach two opposing electrodes. However, Figure 1 of Coleman shows opposing electrodes 1 and 4. The substrate is placed on electrode 1. Source gases are introduced through multiple electrode ports, just as in applicant's invention.

Applicant has argued that Sherman does not teach introducing a cleaning gas through the other electrode. However, in Sherman's main embodiment the deposition gases and etch gases are introduced through the same electrode (see Figure 3c, 5 and 7). Further, using NF₃ gas in other reactors would be obvious to allow for cleaning of those reactors. Such reactors, as in Coleman, only have gas ports through one of the electrodes, so the gas would necessarily be introduced through that electrode.

Regarding the IDS, the examiner was unable to locate the translations of the Japanese references sent in by applicant. It would be greatly appreciated if applicant could supply these translations so that the examiner could consider the references. Applicant was also unsure of which references were considered on pages 3-5 of the IDS submitted 9/4/97. For the record, the only reference not considered on these three pages was the Japanese Patent Publication 57,201,016, for which a translation or statement of relevance was not filed.

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Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,529,474 teaches and depositing a layer and then cleaning the inside of the chamber using nitrogen fluoride (col. 1, lines 53-60).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Whipple whose telephone number is (703) 308-2521.

Charles D. Boush
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Supervisory Patent Examiner
Technology Center 2800

MLW

April 20, 2000